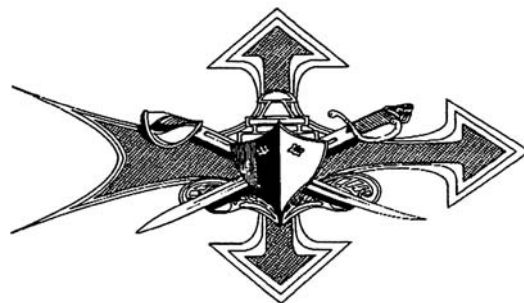


# SHIPS' SAFETY BULLETIN

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APRIL - JUNE 2005

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Suggested routing should include CO, XO, department heads, division officers,  
CMC, CPO mess, petty officers' lounge, work-center supervisors, and crew's mess.  
Blanks provided for initials following review:

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## Are You Preventing Heat Stress Afloat?

By HMC (SW) Misa  
Naval Safety Center

**W**hen we think of heat stress areas on ships we commonly think of laundries, galley spaces, and engineering spaces. But in reality, any space in which strenuous activity takes place should be evaluated as having a potential for heat stress. So how do we manage heat stress on ships to prevent injuries? Assess your ship's program by answering the following questions based on the reference, OPNAV 5100.19D (w/chg 1)

### **Are dry-bulb thermometers permanently installed at all workstations that have a potential for heat stress?**

Paragraph B0204b (1) and appendix B2-A of the instruction provides guidance of how and where thermometers shall be installed. Dry-bulb thermometers also shall be installed temporarily to monitor where repairs/maintenance are performed in a heat-stress area. Dry-bulb thermometers shall be mounted with a non-heat conducting material at least 2 feet from the supply opening and shall be representative of the watchstation.

### **Does a supervisor ensure temperatures are being recorded properly each shift? When temperatures exceed established limits, do you take the appropriate actions for a heat stress survey to be conducted?**

Paragraphs B0204b (3), and (4) provides guidance on temperature recording and required actions. The space supervisor shall take the appropriate actions when established limits are met: circle in red elevated temperatures, notify the division officer/EOOW, and request a heat stress survey.

### **Are heat stress surveys conducted when temperatures exceed established limits?**

Paragraph B0204c (4) (a) provides guidance on temperature limits based on duration of watch/work stations. Appendix B2-A provides physiological heat exposure limits (PHEL) for watch stations. Established limits: PHEL I-III: 100 degrees for watches four hours or less, 90 degrees for watches greater than four hours. PHEL IV-VI: 85 degrees.

#### **COMMANDER, NAVAL SAFETY CENTER, 375 A St. NORFOLK, VA 23511-4399**

This professional flyer is approved for official distribution to the surface force and to their appropriate staffs, schools and other organizations. The information is designed to advise Department of the Navy personnel of current and emerging safety concerns to enhance their professional development and improve operational readiness. This bulletin should not in itself be used as an authoritative document. However, it will cite the appropriate reference when available.

## **Last, but not least; Are personnel who work in these areas being properly trained in dealing with heat stress?**

If you answered no to any of the questions, your heat stress program probably needs improvement. Paragraph B0206a provides crew-training requirements. All personnel shall receive heat stress upon reporting onboard. During recent safety surveys aboard east- and west-coast ships, we continuously find discrepancies regarding management of these items. Watch station supervisors must take a proactive role in ensuring personnel are properly trained in these areas. Review of these items daily by supervisors will not only ensure safe working conditions for personnel but also prevent any health-related mishaps. You can find specific guidance to ensure compliance of these items can be found in Chapter B2 of the OPNAVINST 5100.19D (w/chg 1).

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## **Personal Protective Equipment (PPE) THE KEY TO PERSONNEL SAFETY**

By CWO2 Brian Faulkner  
Naval Safety Center

**T**he use of proper personal protective equipment is simple and is the first line of defense in preventing personnel from injury. A great deal of maintenance and routine ship's evolutions require the use of PPE. Maintenance requirement cards (MRCs) identify PPE required while accomplishing a maintenance action. Material safety data sheets (MSDS) identify PPE to be worn while handling hazardous materials. Ship's instructions and bills also identify PPE to be worn while performing ship's evolutions or working in certain hazardous environments.

However, personnel continue to ignore safety precautions and chose to take chances. Self-preservation is inherent by nature. One may ask, "Why does this trend continue?" There are steps within the daily work process and preparation we can use to identify the need for, and ensure the use, of PPE. Step one is initiated with supervisors reviewing the workday taskings and identifying those actions which require PPE. This may require reviewing MRCs, and ship's instructions.

Once you have identified the need for PPE the worker needs to verify that sufficient PPE is available. The next step is to ensure the individual doing the task is qualified to use the appropriate PPE. For example: if the task requires the use of a respirator, the user must be medically screened and be fit tested by qualified personnel. Once these steps have been accomplished and prior to starting work, once again, verify the maintenance personnel have their PPE with them. The last, and most important step in the process, is monitoring the work being accomplished. This should be an all hands effort as one person can only be in one place at a time.

Supervision does not stop with assigning work and verifying the accomplishment. It involves monitoring progress while ensuring the safety of your subordinates and shipmates. If you see someone not using proper PPE, stop them, and explain to them the importance of wearing the appropriate PPE. If an entire crew takes on this type of approach to safety there should be fewer mishaps, an improved work environment, and preservation of our Navy's number one resource, our people!

Information on PPE and requirements for the use of PPE can be found in OPNAV 5100.19D, the Ship's Baseline Industrial Hygiene Survey, or by reviewing your ship's instructions and bills.

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# Material Readiness, PMS, Safety and the Ship's Duty Fire Marshal

By CWO4 Blair Fike  
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**D**uty fire marshals, if properly trained and supervised, can have a remarkable impact on the material condition of a ship. Fire marshals should be trained to identify, report, and follow up on material and safety discrepancies. Duty fire marshals are required to have a comprehensive understanding of damage control systems and equipment, PMS requirements for DC gear, hotwork requirements, gas-free engineering, water-tight integrity, and shipboard fire-fighting. The duty fire marshal shall complete the applicable portions of the current emergency party PQS, Damage Control Watches, NAVEDTRA 43119-4, and have written authorization from the ship's CO to perform duties.

Fire marshals make tours of the ship throughout the duty day. They are the primary set of eyes for EDO and CDO. Fire marshal responsibilities are found in NTTP 3-20-21, *Surface Ship Survivability*, and include the following:

**Hotwork:** Inspect all hot work sites before and during hot work. Ensure all hot work is authorized and that all safety precautions are adhered to. Make sure fire watches are on station and they understand their responsibilities.

**Fire protection:** Make sure the systems are aligned and ready to operate. Identify, log, and follow-up discrepancies.

**Painting:** Is ventilation properly rigged? Are personnel wearing proper respiratory equipment? Are fumes accumulating within the skin of the ship?

Believe it or not, most damage control discrepancies are related directly to PMS. Here

are some questions to ask when reviewing maintenance accomplishment for your workcenter:

- Are halon CO<sub>2</sub> actuator fittings tight and does the PMS tag reflect adequate maintenance? Are bottles within weight specifications? (MIP 5553/026)
- Are halon power available lights working? (NSTM 300)
- Is ventilation working properly in halon protected spaces such as flammable liquid storerooms and paint lockers? Are airflow alarms set and working properly?
- Is PMS being performed on portable AFFF, PKP and CO<sub>2</sub> fire extinguishers? (MIP 6641/004)
- Are fire stations properly rigged? Have the hoses been hydrostatic tested in the past 36 months? (MIP 6641/004)
- Are explosion-proof lights being maintained properly? Globes should be tight, lead wire seals installed, and the correct type bulbs should be used. (MIP 3301/008)
- Do overboard discharge fittings swivel freely? (MIP 6641/003)
- Are water-tight fittings actually water tight? (MIP 1671/008, 001)
- Is the APC system properly maintained? Check for installation tags on the fusible links. (MIP 5556/003)

This is just a sampling of DC discrepancies I see regularly throughout the fleet. A good duty fire marshal training and qualification program will prevent them from existing on your ship. DCAs train your duty fire marshals one system at a time until they have a complete and thorough understanding of how it works, common discrepancies, and corrective actions. Have a continuous training program in place utilizing training seminars taught by subject matter experts.

Once properly trained and motivated, give your fire marshals the level of authority necessary to get the job done. Test your duty fire marshals level of knowledge often. Ensure the qualification process is not just a “check in the block.”

Develop a standard check sheet for your duty fire marshal. Self-assessment is the key to success. Look at your systems with a critical eye, fix the problems as they arise, and the material condition of readiness will greatly improve.

Standardized DC system check sheets used throughout the fleet as well as numerous training resources can be found at the Navy’s damage control and fire protection website <http://www.dcfp.navy.mil>

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## Do You Know What the Requirements are for a Main Space Eductor?

By GSCS (SW) Joe Petraglia  
Naval Safety Center

**D**uring safety surveys it’s not uncommon to find at least one discrepancy with a main space eductor. Eductors are vital pieces of damage control equipment. It’s imperative to maintain them in proper working order and all requirements are met to ensure safe operation.

The following are some requirements the Naval Safety Center surveyors look for when surveying an eductor along with the references.

1. Are suction strainers installed and adequate? Ref: GSO 529J, NSTM 505-10.7.3.
2. Is there at least one space suction valve, which can be operated from the damage

control deck? Ref: NSTM 505-10.7.2, GSO 529 H and NSTM 593.3.3.1.

3. Is the Oil Pollution Act posted where applicable? Ref: GSO 593 D and NSTM 593.3.3.1. Remember, at any location where you can operate a main space eductor, including the MVHC stations, the warning signs, Oil Pollution Act, and operating instructions are required. You can find the operating instructions and diagram in NSTM 505-10.7.6 and Fig. 505-10-2.

4. Are actuating pressure and suction pressure gauges installed and calibrated? Ref: GSO 529H and NSTM 505 Fig. 505-10-2.

5. Are eductor suction isolation valves provided with the required warning sign stating, “DO NOT OPEN UNTIL VACUUM IS INDICATED ON SUCTION GAGE”. Ref: GSO 529H and NSTM 505-10.7.6D.

6. Are eductor firemain actuating isolation valves provided with the required warning sign stating, "DO NOT OPEN UNTIL OVERBOARD DISCHARGE VALVE IS OPEN". Ref: GSO 529H and NSTM 505-10.7.6D.



7. Are eductor and bilge drain systems properly installed? Ref: NSTM 505-7.1.

8. Are bilges contaminated with oil, fuel or trash? Ref: NSTM 593-3.4.1 and EDORM 2503.B.15.

In accordance with OPNAVINST 5090.1B, *Environmental and Natural Resources Program Manual*: "Ships shall not use eductors to dewater bilges containing oily waste, except in emergency situations when OWS systems (including OWHTs) are not available or are not of sufficient capacity to handle the immediate flow requirements. If a ship must use an eductor, it shall make every effort to discharge beyond 12 nm from land and while underway. The ship shall make an engineering log entry concerning eductor use to discharge bilge waste overboard."

Further more, to ensure the ship is following proper procedures during eductor use and overboard discharge, consult the International Maritime Pollution (MARPOL) wheel. You can order it under NSN 0420-LP-010-1720. By following these guidelines, you will have safe and efficient operations of you space eductors.

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## How Prepared is Your Ship in Preventing Eye Injuries?

By HMC Misa  
Naval Safety Center

**D**uring recent safety surveys, we frequently found discrepancies with portable, gravity-fed emergency eyewash stations. The survey teams saw five-gallon pressurized tanks; six-gallon, green plastic units; and the Fendall Flash Hood 400 that has a one-gallon cartridge. None of these are authorized aboard ships because they do not meet minimum American National Standards Institute (ANSI) NAVOSH water-flow standards.

All Navy shipboard, self-contained portable eyewash stations must provide a minimum flow rate of 0.4 gallons/minute for 15 minutes. Ships having five- or six-gallon eyewash stations should replace them with an approved unit available through the Navy supply system. You can find eyewash-station specifications in paragraph B0508 of OPNAVIST 5100.19D, *NAVOSH Program Manual for Forces Afloat*.

A portable, self-contained eyewash station is an alternative to a plumbed station when a space has no potable water or if plumbed fresh water might contain hazardous chemicals or corrosives. OPNAVINST 5100.19D (w/chg 1) requires all eyewash stations be easily accessible in unobstructed locations and in an area requiring fewer than 10 seconds to reach. An eyewash station should be within 100 feet of any eye hazard. Their station must be clearly marked with a 7"x7" (minimum size) green sign having white lettering indicating "EMERGENCY EYEWASH STATION". Signs are available in the supply system under NSN 9905-01-345-4521, or you can make them in a ship's machine shop.

Also, you can purchase portable eyewash stations from your local ServMart. Unit availability will be limited to the number of vendors distributing their products to ServMart. There are some manufacturers such as Bradley, Fendall, and Emedco-from which ServMart can readily order self-contained units. Procurement can also be made through your ship's supply department from the listed information. (All listed units meet ANSI STD Z358.1-1990)

### NOMENCLATURE   U/I   PRICE

Plumbed, permanent installation		
Fountain, Eyewash, foot pedal operated		
9Z/4510-01-324-5141 EA		536.71
Fountain, Eye and face wall mounted, stainless steel bowl		
9Z/4230-01-010-3171 EA		71.13
9Z/4510-01-107-5660 EA		157.80

Fountain, eye and face wash  
 steel, plastic heads, hand operated  
 9Z/4510-01-301-9950 EA 204.38  
 Shower/eye and face wash combo, stainless  
 10" diameter stainless steel bowl  
 APL 670180005  
 9Z/4510-01-161-0186 EA 653.66  
 9Z/4510-00-400-5144 EA 511.79

Eye and face wash model, Western Drinking  
 fountain Model No 200BT. 2 chrome  
 plated brass, full-face drench spray heads.  
 APL 679990164  
 9Z/4510-01-184-5511 EA 170.15

Plumbed eye wash station spare parts:  
 Valve, calibrated flow, HAWS Model SP38  
 9C/4820-01-297-5182 EA 87.40  
 Seat, valve, HAWS model SP-18  
 9C/4020-01-270-5826 EA 523.26

Head, eyewash, green rubber, 1/4" inlet, HAWS  
 model 72608, round  
 9Z/4510-01-320-3781 EA 24.33

Head, eye wash, green plastic, 2" diameter,  
 1/4" inlet, with screen  
 9Z/4510-01-309-4136 EA 29.45

Portable, gravity-type units  
 Fountain, eye and face wash, portable,  
 gravity fed 16 gallon, green or yellow  
 plastic  
 9Z/4240-01-258-1245 EA 181.69

Eye Wash Sign Face, Adhesive, (green & white  
 eyewash station sign) (EACH PG CONTAINS  
 20 EACH)  
 9Q/9905-01-345-4521 PG 8.43

Since these manufacturers make various  
 portable units, be sure your purchase meets  
 OPNAVINST 5100.19D (w/chg 1)  
 specifications listed in the PMS 6600-series  
 MIP.

Eyewash stations are only a last resort:  
 Sailors should always wear prescribed, chemical  
 splash-proof or non-vented goggles when

working with chemicals or when painting.  
 Goggles also should be worn when scraping,  
 chipping, or working near any potential eye  
 hazards. Protective eyewear should meet  
 American National Standards Institute (ANSI)  
 Z-358 requirements.

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## Is the Water Hot Enough?

By MM1 Karlus Smith  
 Naval Safety Center

Everyone likes a hot shower after a long hard  
 day at work. "Hey, someone adjust the hot  
 water heater because we have run out of hot  
 water." Sound familiar?

All too often this is a common request  
 onboard ship. Adjusting the regulator without  
 the proper equipment and training can threaten  
 safe operation and increase the opportunity for  
 a mishap. According to paragraph 2.3.7 of  
 NSTM 533, *Potable Water Systems*, "Water  
 heaters shall be set and periodically checked  
 and reset, if necessary, to maintain  
 temperatures no greater than 130 degrees  
 Fahrenheit for personal usage, a minimum of  
 160 F for galley grease interceptor hoods/pot  
 sanitizing sinks, and 180 F for service to galley  
 dishwashers and laundry machines that are not  
 provided with their own integral booster  
 heaters."

Changes in steam supply conditions,  
 periodic interruptions in water supply, and the  
 motion of the ship frequently cause hot water  
 mishaps. Because of this, both types of water  
 heaters installed aboard ship contain a number  
 of safety devices.

The types of water heaters utilized on Navy  
 ships are steam and electric. For steam heaters,  
 steam heating coils in the water tank heat the  
 water stored for use. An automatic temperature-  
 regulating valve for controlling the flow of

steam to the water heater to maintain the required outlet water temperature is provided. During normal operation, the regulating valve will supply enough steam heat to the water heater which provides hot water at 130 degrees. An electrically controlled safety shut off device monitors the outlet temperature and the temperature-regulating valve position, which will isolate steam supply to the heat exchanger when the outlet water temperature rises above the set point (130 F) as per PMS (MIP 5331 series). A red telltale jeweled light, located at the solenoid valve, will illuminate to indicate that the steam supply has been isolated when a high temperature condition exist.

For electric heaters, there is a large pressure tank fitted with internal electric heating elements. The operating principle is similar to a steam water heater except the safety shut-off device. Fitted with an "ON-OFF" switch and a low-water-level indicator, the water heater is designed so the tank can be cleaned, and the heating elements and thermostatic switch readily removed for maintenance without disturbing the tank's insulation or removing the piping.

There are three safety devices (Detroit switches) utilized to protect the water heater and prevent scalding. One safety device located in the central storage heater de-energizes electric power to the heating elements when the outlet temperature rises above 130 F. The second safety device isolates electrical power to the entire unit when an over-temperature condition exists (as per PMS/MIP 5331 series). The third device is a low-water control that de-energizes the heater when the water level drops to less than one inch above the heating elements. Each water heater has a thermometer installed in the top of the tank for visual monitoring.

As a good practice you can make a local log sheet with the hot water heater number and temperature settings making it part of your daily rounds. A sample log sheet is provided to demonstrate effective monitoring.

## **Hot Water Heater Temperature Log**

**Date:**

**Laundry Heater Range: 173-180 F.**

**Berthing Areas Range: 120-130 F.**

Time	Heater No.	Location	Temp	Sat/Unsat Discrepancies
0800	1	Laundry	176	Sat
0900	2	Ops Berth	128	Unsat/ Missing Locking Device
1000	3	Officers Country	126	Sat
1100	4	CPO Berth	129	Sat
1200	1			
1300	2			
1400	3			

Only qualified personnel should adjustment the temperature-regulating valve. Ensure there is an anti-tampering device (locking assembly) installed to prevent unauthorized adjustments. Remember, take care of your water heater and it will take care of you.

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